U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Abronia alpina*

COMMON NAME: Ramshaw Meadows sand-verbena

LEAD REGION: Region 8

INFORMATION CURRENT AS OF: November 2005

STATUS/ACTION

___ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
_X_ Continuing candidate
__ Non-petitioned
X Petitioned - Date petition received: __May 11, 2004_____
_ 90-day positive - FR date:
_ 12-month warranted but precluded - FR date:
_ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:
a. Is listing warranted (if yes, see summary of threats below)?
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions?
c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.

_X__ Listing priority change
Former LP: _11__
New LP: __8_
Date when the species first became a Candidate (as currently defined): 1975
___ Candidate removal: Former LPN: ___
___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.
___ F – Range is no longer a U.S. territory.
___ I – Insufficient information exists on biological vulnerability and threats to support listing.
___ M – Taxon mistakenly included in past notice of review.
___ N – Taxon does not meet the Act's definition of "species."

___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: ***Nyctaginaceae (***Four-O'Clock ***family)***

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: California

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: California

LAND OWNERSHIP
The only known sites of this species are located on land owned by the U.S. Forest Service. Property within the center of Ramshaw Meadow and adjacent to the sand flats supporting Abronia alpina, was privately owned by Mammoth Meadows Associates, but in 2004, a land exchange was completed and all of Ramshaw Meadow is now under U.S. Forest Service jurisdiction.

LEAD REGION CONTACT Deborah Pierce (CNO) 916-414-6464, Deborah_Pierce@fws.gov

LEAD FIELD OFFICE CONTACT: Arnold Roessler, Kathy Brown, Sacramento Fish and Wildlife Office (916) 414-6600. Arnold_Roessler@fws.gov; Kathy_Brown@fws.gov

BIOLOGICAL INFORMATION

Species Description, Taxonomy, and Range

Abronia alpina is a small, generally glandular, deeply-rooted perennial herb, 2.5 to 15.2 centimeters (1 to 6 inches) across forming compact mats. The flowers are lavender-pink, trumpet-shaped, and generally fragment with 4-5 lobes (Munz 1959; Hickman 1993). The plant is found on dry open slopes of easily disturbed granitic gravel along meadow margins between the lodgepole pine forest and sagebrush scrub plant communities. The plant is located in Ramshaw and Templeton Meadows at an elevation between 2,621 to 2,652 meters (m) (8,600 to 8,700 feet (ft)) (California Native Plant Society (CNPS) 1979; 1989). The soils are sterile, porous, subject to extreme diurnal temperature change and easily disturbed (California Department of Fish and Game (CDFG) 1989a).

The species flowers from May to September. A. alpina exhibits a predominantly monocarpic reproductive strategy (one fruiting period during the life cycle), resulting in low fecundity. The mature fruit develops on a recurved stem which is subsequently deposited beneath or in very close proximity to the parent plant (Wilson 1970; CDFG 1989b). This mechanism may act as barrier to dispersal to more distant, suitable (or unsuitable) sites while ensuring that the propogules are retained at a known, favorable site (Wilson 1970).

Townshend Brandegee described this taxon in 1899 from specimens collected by Joseph Purpus

at “Monatchy” Meadows near Mt. Whitney in 1896 (Brandegee 1899). For a number of years, this species was thought to have been extirpated, but it was rediscovered in 1970 in Ramshaw Meadow, Tulare County, California. No plants have ever been found at Monache Meadow. This reference is probably to what is now called Strawberry Meadows on the southeast side of Templeton Mountain (Wilson 1970). The whole complex was once called “Monache.” Otherwise, the 1896 collection was either referenced erroneously as the type collection or has since become extirpated.

Abronia alpina is known from one main population center in Ramshaw Meadow on the Kern Plateau of the Sierra Nevada and from one subpopulation found in adjacent Templeton Meadow. Of the 34 recognizable subpopulations, all but the Templeton Meadow population, are found around the borders of Ramshaw Meadow. Much of the Kern Plateau was surveyed during 1984-1989, and it is unlikely that additional surveys will locate new populations (USDA Forest Service 1995). The total estimated area occupied is approximately 6 hectares (15 acres). Population estimates from 1985-1994 range from a low of 69,652 plants in 1986 to 132,215 plants in 1987. Surveys conducted since 1994 indicate that no significant changes have occurred in population size or location, although, the 2003 survey showed population numbers to be at the low end of the range. The population fluctuates from year to year without any clear trends (USDA Forest Service 2004).

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Lodgepole pine encroachment may alter soil characteristics by increasing organic matter levels, decreasing porosity, and moderating diurnal temperature fluctuations thus reducing the competitive ability of Abronia alpina to persist in an environment more hospitable to other plant species. Lodgepole pine is becoming established within A. alpina habitat in some subpopulations. Currently, it appears that in two subpopulations, up to 20 percent of the area potentially occupied by A. alpina is now occupied by relatively young (<25 years) lodgepole pine. In addition, smaller portions of the habitat for seven other subpopulations are occupied by young lodgepole pine (USDA Forest Service 2004). The rate at which encroachment is occurring has not been determined, although the latest evaluation in 2003 did not indicate that the encroachment is affecting the A. alpina populations in the short term. Pine encroachment evaluations with monitoring photographs and species surveys are currently scheduled every three years. The Forest Service has determined that lodgepole pine encroachment into A. alpina habitat is still a threat (USDA Forest Service 2004).

The Ramshaw Meadow ecosystem is subject to potential alteration by lowering of the water table due to downcutting of the South Fork of the Kern River (SFKR). The SFKR flows through Ramshaw Meadow, at times coming within 15 m (50 ft) of Abronia alpina habitat, particularly in the vicinity of five subpopulations. The habitat occupied by A. alpina directly borders the meadow system supported by the SFKR. The downcutting and lowering of the water table could potentially affect the hydrological regime associated with the meadow system and alter the habitat along the margins of the meadow where A. alpina occurs. Drying out of the meadow

system could also potentially affect A. alpina pollinators and/or seed dispersal agents by altering plant species composition - explain why this would happen. In Ramshaw Meadow and in other meadow systems within the same watershed, livestock trampling, along with the removal of bank stabilizing vegetation by grazing livestock, has been at least partially responsible for the downcutting of the SFKR (USDA Forest Service 2001).

Established hiker, packstock, and cattle trails pass through Abronia alpina subpopulations. Two main hiker trails pass through Ramshaw Meadow, but were rerouted out of A. alpina subpopulations where feasible, in 1988 and 1997 (USDA Forest Service 2004). Also located in and around A. alpina populations are previously established backpacker and packstock user campsites. Loose herding of livestock, general recreational use, and poorly located campsites have resulted in substantial impacts to several A. alpina populations in the past (USDA Forest Service 1995) due to ground disturbance and trampeling. Recreational use between 1983-1994 within the Trout Creek Wilderness (where Ramshaw and Templeton meadows are located) showed a 48 percent increase over the eleven year period (USDA Forest Service 1995). The rerouting of the trails and dismantling of known campsites within and near the populations of A. alpina have greatly reduced the recreational disturbances to the species (USDA Forest Service 2004). Remnants of cattle trails that pass through subpopulations in several places still receive occasional incidental use by horses and sometimes hikers. Cattle use, however, currently, is not a threat due to the 2001 implementation of a ten year moratorium on the Templeton allotment which prohibits cattle from all Abronia alpina locations. The Forest Service has identified livestock trampling; trails/hikers; and camping as three of the four major threats still currently affecting A. alpina populations (USDA Forest Service 2004).

B. Overutilization for commercial, recreational, scientific, or educational purposes.

None known.

C. Disease or predation.

Gopher activities may result in significant destruction of Abronia alpina. Whole plants have been known to disappear, possibly either eaten or used for den building. In some areas, soil has been pushed up around gopher burrows completely covering the A. alpina plants. A. alpina is not eaten by cattle or deer, but light grazing by rabbits and gophers has been observed. Ant herbivory also has been observed on some subpopulations. The level of impact to A. alpina resulting from these activities does not appear to be substantial and we do not consider the species to be threatened or endangered as a result of this factor. Disease is not known to be a factor at this time. However, due to its limited distribution and small population size, A. alpina would be highly susceptible to disease should an outbreak affecting the species occur.

D. The inadequacy of existing regulatory mechanisms.
The Forest Service is currently managing the impacts on the species through the Sierra Nevada Forest Plan Amendment (USDA Forest Service 2004). We are unaware of any impact to A. alpina resulting from inadequacy of existing regulatory mechanisms and we do not consider the species to be threatened or endangered as a result of this factor.

E. Other natural or manmade factors affecting its continued existence.

Subpopulations are subject to trampling by packstock and campers in addition to trampling from use of the area by those recreating in the area. Campsites have been removed from four subpopulations locations. Resource crews may have removed other campsites that were unreported. Some of these campsites have occasionally recurred. One campsite adjacent to two subpopulations has resulted in trampling of these subpopulations on occasion. These are all informal campsites, established by users. Although the majority of campsites within or near Abronia alpina populations have been removed, recreational use has still been identified by the Forest Service as a threat to the species (USDA Forest Service 2004)

Significant trampling of Abronia alpina subpopulations by cattle has occurred in the past. Some of the subpopulations are protected by fencing, while the protection of other occurrences was dependent on close adherence to the trailing route. In 2001, the U.S. Forest Service made the decision to discontinue grazing on the Templeton allotment, which includes Ramshaw Meadow, for a period of 10 years (K. Nelson, pers. Comm. 2004).

In January 2004, the USFS amended the Sierra Nevada Forest Plan Amendment, based on the final supplemental environmental impact statement (FSEIS) (USDA Forest Service 2004), following a review of vulnerability assessments conducted on 135 threatened, endangered, proposed-for-listing, and sensitive plant species. It was determined that livestock grazing posed a threat to this species. Livestock grazing in Ramshaw and Templeton Meadows (where the plant is endemic) does not currently pose a threat because this allotment is now vacant. However, some incidental trailing through the habitat may occur (USDA Forest Service 2004). The FEIS notes that future decisions to allow livestock grazing will consider effects to this species and may require updating existing management practices (USDA Forest Service 2004).

Abronia alpina has reproductive strategies that decrease the ability of this plant to expand its range: 1) A. alpina appears to have very poor seed dispersal capability which may have contributed significantly to the species rarity. As the anthocarp (fruit) matures, the peduncle (stalk) recurves, plunging the mature fruit beneath the plant, and thereby limiting its means of dispersal (Wilson 1970). This serves to retain anthocarps on favorable sites, thus reducing the probability for dispersal downslope into meadow and sagebrush habitat where establishment is not possible. However, this mechanism is also restrictive in that it does not provide any apparent means for dispersal of anthocarps to more distant favorable sites. No dispersal vectors have been identified. A. alpina apparently is slow to recover from disturbance because of reproductive and dispersal limitations, short life span, and high annual fluctuation in population numbers. 2) A. alpina exhibits a predominantly monocarpic reproductive schedule (one fruiting period during the life cycle), resulting in low fecundity. Monocarpic plants rarely produce more than about 10 flowers in their abbreviated lifetimes.

Additionally, the fragmented nature of the population may limit gene flow and contribute to poor resiliency. The population is fragmented into several subpopulations by breaks in habitat, such as forested areas or rock outcrops, between the sand flats. It is unclear whether or not these

breaks in habitat are substantial enough to limit genetic interchange between subpopulations, and without further study these potential genetic threats are not considered significant at this time.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

The Forest Service has developed a management plan and Draft Conservation Agreement (USDA Forest Service 2001) for Abronia alpina and has implemented management strategies for the protection of the species. The current management strategies which have been implemented include: removal of the grazing allotment from the two meadows where A. alpina occurs; relocation of recreational use trails adjacent and through A. alpina populations; removal of primitive campsites from within and near A. alpina populations; and monitoring of plant populations and visitor/livestock impacts. Every three years, the Forest Service conducts monitoring surveys that collect species distribution, abundance, and age class data. The monitoring also includes assessment of trampling damage in Ramshaw Meadow due to off-trail hiking and packstocking.

SUMMARY OF THREATS

The major threats facing Abronia alpina include habitat disturbance and trampling from incidental livestock trailing, pack animals, and hikers; campsite development; and erosion associated with such disturbances. An additional threat is encroachment of lodgepole pine into areas occupied by the species.

For species that are being removed from candidate status:
___Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE)?

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	**Imminent**	Monotypic genus	7
		Species	8*
		Subspecies/population	9

	Non-imminent	Monotypic genus Species Subspecies/population	10 11 12

Rationale for listing priority number:

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species. We reviewed the available published and unpublished scientific and commercial information, and information submitted to us during our review. On the basis of this review, we find that the listing of Abronia alpina is warranted but precluded by pending proposals for other species with higher listing priorities.

Magnitude: The magnitude of threats to Abronia alpina was determined to be low. A. alpina face ongoing threats from forest encroachment, cattle trailing, and human activities that cause direct mortality and degradation of habitat. all of the species' range occurs on Federal land, which protects the species from private development and facilitates management of the species by Federal agencies. In 2001, the U.S. Forest Service decided to discontinue grazing on the Templeton allotment, which includes Ramshaw Meadow, for a period of 10 years. Consequently, livestock grazing does not currently occur in the two meadow areas where the species is found. The Forest Service could change their decision 5 to 6 years from now, when the 10-year period ends and livestock trailing within A. alpina habitat may still occur.

Imminence: The threats to Abronia alpina are imminent. Lodgepole encroachment is occurring at a very slow rate and trampling, habitat disturbance and resulting erosion of A. alpina plants and habitat is still occurring although these threats have been reduced.

X Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? After reviewing the current status and distribution of Abronia alpina and the threats associated with the species we have determined that an emergency listing of the species is not warranted at this time. A. alpina occurs entirely of Federal land and the two locations are not subject to development pressures. Grazing allotments for the two meadows have been discontinued and recreational trails have been diverted around the area containing the species. The Forest Service has developed a management plan for the species and is in the process of developing a conservation agreement with the Service for the species.

DESCRIPTION OF MONITORING

We will continue to coordinate efforts with the U.S. Forest Service on protecting and monitoring the two areas containing Abronia alpina. Every three years, the Forest Service conducts monitoring surveys that collect species distribution, abundance, and age class data. The monitoring also includes assessment of trampling damage in Ramshaw Meadow due to off-trail hiking and packstocking.

COORDINATION WITH STATES

The state of California does not have a status for this plant. A petition to list the species as threatened was forwarded from the Department of Fish and Game to the State Fish and Game Commission in 1989 (CDFG 1989). Due to management actions being undertaken by the Forest Service the Commission determined that listing was not warranted. We consulted the California Natural Diversity Database regarding the status of known populations of Abronia alpina.

Indicate which State(s) did not provide any information or comments: none

LITERATURE CITED

Brandegee, T.S. 1899. New Species of Western Palnts. Bot. Gaz. 27:444-457.

California Department of Fish and Game. 1989a. Draft Recommendation to the State of California Fish and Game Commission.

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Hickman, J. C. (ed.). 1993. The Jepson Manual: Higher Plants of California. University of California Press. Berkeley, California.

Munz, P.A. 1959. A California Flora. University of California Press, Berkeley and Los Angeles. 1681 pp.

USDA Forest Service. 1995. Species Management Guide for Abronia alpina Bdg. 14 pp. + Appendices A-D.

USDA Forest Service 2001a. Draft Conservation Agreement Abronia alpina Bdg. Alpine Sand-verbena. 12pp.

USDA Forest Service. 2004. Sierra Nevada Forest Plan Amendment, Final Supplemental Environmental Impact Statement. Volume 1, Chapter 3, Part 2, p 173.

Wilson, Ruth. 1970. The rediscovery of Abronia alpina, a rare specialized endemic of sandy meadows in the southern Sierra Nevada, California. Aliso 7:201-205.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: /s/ Paul Henson April 26, 2006
Acting CNO Manager, Fish and Wildlife Service Date

Concur: _____ August 23, 2006
Acting Director, Fish and Wildlife Service Date

Do not concur: _____
Director, Fish and Wildlife Service Date

Date of annual review: November 2005
Conducted by: Kathy Brown